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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/759,746	01/12/2001	David A. Cathey	92-0466.04	9740
7590		04/20/2004	EXAMINER	
JAMES R DUZAN		HARPER, HOLLY R		
TRASKBRITT PC		ART UNIT		
P O BOX 2550		PAPER NUMBER		
SALT LAKE CITY, UT 84110		2879		

DATE MAILED: 04/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/759,746

Applicant(s)

CATHEY, DAVID A.

Examiner

Holly R. Harper

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 23-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 23-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |  |
|--|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date: ____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                                    | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date: ____ | 6) <input type="checkbox"/> Other: ____  |

## **DETAILED ACTION**

### ***Response to Amendment***

The Amendment, filed on 2/3/04, has been entered and acknowledged by the Examiner.

Claims 23, 25, and 27 have been amended.

Claims 31 and 32 have been canceled.

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 23-24 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 23 has the limitation that the doping material in the protuberance is greater at the base of the emitter than at the apex. The original disclosure as a whole fails to disclose the claimed limitation, but instead describes a protuberance with the greatest amount of doping at the apex of the emitter that decreases towards the substrate. Therefore, there does not appear to be sufficient disclosure to suggest that the applicant had possession of the claimed material at the time of filing.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 25 and 27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 25 and 27 state “an apex having an impurity concentration substantially the same as portion of the single-layered substrate at the upper surface thereof”. This limitation is unclear whether the apex of the emitter has the same dopant concentration as the base of the emitter (the current substrate), if the limitation is comparing the dopant concentration of the apex of the emitter to the dopant concentration of the substrate before the emitter was formed, or if the apex of the emitter has the highest concentration gradient and the gradient decreases with a distance from the apex. For the purpose of examination, the claim is interpreted to mean that the apex of the emitter has the greatest concentration and the concentration decreases with a distance from the apex of the emitter.

Claim 25 has the limitation “a remaining portion of a single layered substrate” in line 2. It is unclear what the applicant is referencing. There has not been a single layered substrate previously claimed so there can be no remaining portion.

Claim 25 has the limitation “uncontaminated single layered substrate” in line 3, but is followed by the limitation “the single layered substrate having an impurity concentration greatest ...” in lines 4-5. It is believed the first limitation should not contain the word “uncontaminated”.

Claim 27 has the limitation “generally uncontaminated substrate” in line 2, but is followed by the limitation “the single layered substrate having an impurity concentration greatest ...” in lines 3-4. It is believed the first limitation should not contain the word “uncontaminated”.

### ***Claim Objections***

5. Claims 25 and 27 are objected to because of the following informalities:

Claim 25 has the limitation “impurity concentration substantially the same as portion...” in line 9. The claim should read “the same as a portion...”

Claim 25 has the limitation “a decreasingly contaminated body, the concentrate of the impurity...” in line 11. The claim should read “a decreasingly contaminated body, the concentration of the impurity...”.

Claim 27 has the limitation “the concentration substantially the same as portion...” in line 7. The claim should read “the same as a portion...”

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 25-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Bol (USPN 5,269,877).

In regard to claim 25, the Bol reference discloses an FED with a single layered polysilicon (semiconductive) substrate (Figure 6, Element 12 and Column 3, Line 67- Column 4, Line 1). The single layered substrate is used to create an emitter tip with a decreasing dopant gradient (Figure 12 and 6) where the greatest concentration of dopant is at the apex of the emitter.

In regard to claim 26, the Bol reference discloses that the emitter (Figure 6, Element 22) is integral with the substrate (Figure 6, Element 12).

In regard to claim 27, the Bol reference discloses an FED with a single layered polysilicon (semiconductive) substrate with a decreasing dopant concentration (Figure 6, Element 12 and Column 3, Line 67- Column 4, Line 1) and an emitter tip with a decreasing dopant gradient (Figure 12 and 6) where the greatest concentration of dopant is at the apex of the emitter. The emitter tip has an etch-resistible quality that increases with depth from the apex (Column 3, Lines 44-46).

In regard to claim 28, the Bol reference discloses that the emitter has an oxidizable quality that increases with elevation from the base (Column 4, Lines 4-7).

In regard to claim 29, the Bol reference discloses that the etch-resistible quality increases as the doping concentration decreases (Column 3, Lines 44-46). Therefore, a portion of the emitter tip has the same etch-resistible quality as the base.

In regard to claim 30, the Bol reference discloses that the oxidizable quality is directly related to the amount of dopant concentration and will decrease as the amount of doping decreases (Column 4, Lines 4-7). Therefore, a portion of the emitter tip has the same oxidizable quality as the base.

***Response to Arguments***

8. Applicant's arguments filed 2/3/04 have been fully considered but they are not persuasive.

Regarding applicants claim that Bol discloses an emitter made from the middle of a substrate instead of the upper surface of a substrate, the examiner respectfully agrees. However, this is drawn to a process of manufacturing, which is incidental to the claimed apparatus. It is well established that a claimed apparatus cannot be distinguished over the prior art by a process limitation. Consequently, absent a showing of an unobvious difference between the claimed product and the prior art, the subject product-by-process claim limitation is not afforded patentable weight (see MPEP 2113). The Bol reference discloses an emitter tip that has an emitter tip formed from a substrate with a dopant concentration that is greatest at the apex and decreases toward the base.

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Holly Harper whose telephone number is (571) 272-2453. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel, can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



Holly Harper  
Patent Examiner  
Art Unit 2879



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